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A Bruce Clay IBM Corporation Dept T81 062 3039 Cornwallis Road Research Triangle Park, NC 27709			EXAMINER MAURO JR, THOMAS J	
		ART UNIT 2143	PAPER NUMBER	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/627,518	CUOMO ET AL.
	Examiner Thomas J. Mauro Jr.	Art Unit 2143

~ The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on \_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-26 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-26 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 28 July 2000 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 11) The proposed drawing correction filed on \_\_\_\_ is: a) approved b) disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.  
 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.  
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) The translation of the foreign language provisional application has been received.  
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.  
 4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_.

1. Claims 1-26 have been examined.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2 and 11-12 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S.

Patent No. 6,470,389 to Chung et al.

4. With respect to claim 1, Chung et al. teaches a method comprising: calculating a first value based on the session identification (**Col. 4 lines 37-39 – The client IP address which acts as the session identifier has a first value calculated from it by performing a hash function on the session identifier**); and routing the request to a server based on the first value (**Col. 4 lines 59-63 – The computed hash value from the session identifier is compared to a list of servers to determine which server should handle the request**).

5. With respect to claim 2, Chung et al. further teaches wherein the step of calculating a first value comprises performing a hash function on the session identification (**Col. 4 lines 37-39 –**

**An appropriate hash function is used on the client IP address, also known as, the session identifier).**

6. With respect to claims 11 and 12, they are apparatus claims corresponding to the method claimed in claims 1 and 2. Therefore, claims 11 and 12 are rejected under the same rationale.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was mad

8. Claims 3-5, 7-10 and 13-15, 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al. in view of Muller et al., and further in view of U.S. Patent No. 6,470,008 to Khuc.

9. Regarding claim 3, Chung et al. does not explicitly teach the invention as claimed. Muller et al, however, teaches performing a modulus function on the first value to form a first integer (**Muller et al. -- Col. 49 lines 52-53 – After hashing, a modulus function is performed. This, by the function's nature, produces an integer value**). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Chung et al. and Muller et al. in order to create a fixed-size,

integer value which maps to a particular server in order to be used for dispatching. Muller et al., however, fails to teach selecting a server based on the first integer.

Khuc teaches a look-up table which uses integers as the index into the table to determine which server to route the request to (**Figure 5 & Col. 9 line 10 – The first (indexing) column comprised of integer values in the look-up table is used to select the IP address of a particular server that should service the request**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Chung et al. in view of Muller et al., as shown above, with the integer indexed look-up table of Khuc in order to provide an efficient way to quickly find the correct server to which the request will be routed.

10. Regarding claim 4, Chung et al. in view of Muller et al. does not explicitly teach the invention as claimed. However, Khuc teaches selecting a server to route to by looking up the server in a look-up table using the first integer (**Figure 5 & Col. 9 line 10 – The first (indexing) column comprised of integer values in the look-up table is used to select the IP address of a particular server that should service the request**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the server routing look-up table as taught by Khuc into the invention of Chung et al. in view of Muller et al. in order to provide a fast and easy way to determine from an integer value which server should process the client's request.

11. Regarding claim 5, Chung et al. teaches selecting a first server based on the first value (Col. 4 lines 59-63 – **The computed hash value (first value) from the session identifier is compared to a list of servers to determine which server should handle the request**). Chung et al. fails to teach determining whether the first server is functional; and routing the request to the first server in response to the first server being functional.

Khuc, however, teaches a routing system which determines whether the first server is functional (Col. 9 lines 36-39 – **By changing the percent allocation field in the look-up table, this will determine whether the server is function, i.e. percent allocation = 0, then non-functional and percent allocation >0, functional**); and routing the request to the first server in response to the first server being functional (Col. 9 lines 32-34 – **As long as the percent allocation, as described above, is not “0”, the routing systems will route the request to the primary server**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teachings of Khuc for determining whether a server is functional or not and routing the request based on that information into the invention of Chung et al. in order to provide a level of fault-tolerance to prevent the dispatching of a client to a server which is down.

12. Regarding claim 7, Chung et al. does not explicitly teach the invention as claimed. Khuc, however teaches the invention substantially as claimed, wherein the step of determining whether the first server is functional comprises using a look-up table (Figure 5 & Col. 9 lines 37-39 – **By comparing the percent allocation field in the look-up table, this will determine whether the server is function, i.e. percent allocation = 0, then non-functional and percent allocation >0,**

functional).

13. Regarding claim 8, Chung et al. in view of Muller et al., and further in view of Khuc teach the invention substantially as claimed, a method for routing a request to one of a number of servers, comprising: receiving a request including a session identification (Chung et al. -- Col. 7 lines 64-66 – **The request packet contains the client IP address (session identification);** performing a hash function on the session identification to form a hash value (Chung et al. -- Col. 4 lines 37-39 and Col. 7 lines 64-66 – **An appropriate hash function is used on the client IP address, also known as, the session identifier**); performing a modulus function on the hash value to form an integer (Muller et al. -- Col. 49 lines 52-53 – **After hashing, a modulus function is performed. This, by the function's nature, produces an integer value**); and routing the request to one of the number of servers based on the integer (Khuc -- Figure 5 & Col. 9 line 10 – **The first (indexing) column comprised of integer values in the look-up table is used to select the IP address of a particular server that should service the request**).

14. Regarding claim 9, Chung et al. does not explicitly teach the invention as claimed. Muller et al., however, teaches the invention substantially as claimed, wherein the integer is between zero and the number of servers minus one (Col. 49 lines 52-54 and lines 63-66 – **By performing the modulus function over the hash function result using the number of available components, i.e. servers, the resulting integer must be between 0 and N-1 components, i.e. servers**).

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15. Regarding claim 10, Chung et al. does not explicitly teach the invention as claimed. Khuc, however, teaches the invention substantially as claimed, wherein the step of routing the request comprises looking up the server in a look-up table using the integer (**Khuc – Figure 5 & Col. 9 line 10 – The first (indexing) column comprised of integer values in the look-up table is used to select the IP address of a particular server that the client should be routed to in order to service the request**).

16. Regarding claims 13-15, 17 and 19-20, they are apparatus claims corresponding to the method claimed in claims 3-5 and 7-10. Therefore, claims 13-15, 17 and 19-20 are rejected under the same rationale.

17. Regarding claim 18, Chung et al. teaches the invention substantially as claimed, an apparatus for routing a request to one of a number of servers, comprising:

- a. A processor; and
- b. A memory electrically connected to the processor, the memory having stored therein a program to be executed on the processor (**Chung et al. -- Col. 7 lines 45-47 – By having an operating system (OS), it is inherent that in order for the OS to process tasks and store/run not only itself but also the routing algorithm correctly, a processor and memory must be contained within the dispatcher**) for performing: receiving a request including a session identification (**Chung et al. -- Col. 7 lines 64-66 – The request packet contains the client IP address (session identification)**); performing a hash function on the session identification to form a hash value (**Chung et al. -- Col. 4 lines 37-39**

**and Col. 7 lines 64-66 – An appropriate hash function is used on the client IP address, also known as, the session identifier); performing a modulus function on the hash value to form an integer (Muller et al. -- Col. 49 lines 52-53 – After hashing, a modulus function is performed. This, by the function’s nature, produces an integer value); and routing the request to one of the number of servers based on the integer (Khuc -- Figure 5 & Col. 9 line 10 – The first (indexing) column comprised of integer values in the look-up table is used to select the IP address of a particular server that should service the request).**

18. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al. in view of Muller et al. and Khuc as applied to claims 3-5, 7-10 and 13-15, 17-20 above, and further in view of U.S. Patent No. 6,591,250 to Johnson et al.

19. Regarding claim 6, Chung et al. teaches calculating a second value in response to the first server being non-functional; and routing the request to a second server based on the second value (**Chung et al. -- Col. 7 lines 9-12 – When a server is down, the dispatch will rehash the IP address, i.e. session identifier, and route this and all subsequent packets to the newly mapped server to prevent any lost data packets caused by the failure**). Chung et al. fails to teach that the second value is calculated from the first value.

Johnson et al., however, teaches a method for performing a hash function twice using the first hashed value in the second hash function, i.e.  $H(K, H(K, M))$  (**Johnson et al. Col. 13 lines 30-32**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Chung et al. and Johnson et al. by implementing the two-pass hash function as taught in Johnson et al. into the dispatching algorithm of Chung et al. in order to increase the speed with which the dispatcher re-routes the requests by using the same algorithm already in place with different values and also to increase the encryption level of session information which in turn, provides greater security all-around.

20. Regarding claim 16, this is an apparatus claim corresponding to the method claimed in claim 6. Therefore, claim 16 is rejected under the same rationale.

21. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,470,389 to Chung et al. in view of U.S. Patent No. 6,560,717 to Scott et al., and further in view of U.S. Patent No. 6,584,466 to Serbinis et al.

22. Regarding claim 21, Chung et al. teaches the invention as claimed, a distributed processing system comprising: a client computer (**Chung et al. -- Figure 4 – Item 52**); and a web server, connected to the client computer, the first server, and the second server, the web server for routing a request from the client computer to one of the first server and the second server (**Chung et al. -- Figure 4 – item 64 – The dispatcher is a web server which is connected to servers 54-1, 54-2, and 54-N**). In addition, Chung et al. teaches a plurality of servers, including a first server and a second server (**Chung et al. -- Figure 4 – Servers 1, 2, ...N**), however fails to teach that the servers are application servers.

Scott et al., however, teaches a load balancing system which contains a plurality of application servers including, a first application server and a second application server (**Scott et al. -- Figure 1 items 24a and 24b and Col. 3 line 8**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the type of servers in Chung et al. to be application servers as taught in Scott et al. as an obvious system alteration in order to provide greater system flexibility and use.

In addition, Chung et al. fails to teach a database, connected to the first application server and the second application server, for storing session data associated with the request.

Serbinis et al., however, teaches a database connected to each server which stores information, including, user session information (**Serbinis et al. -- Figures 1A, 1B, 2, Col. 5 lines 26-34 and Col. 6 lines 20 and 41-42**)

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the database connected to a plurality of servers as taught by Serbinis et al. into the invention of Chung et al. in order to provide a data repository to store session data information which would allow service requests to be processed more efficiently by the servers using the information they could provide to each other, i.e. session information, which would be stored in the database.

23. Regarding claim 22, Chung et al. does not explicitly teach the invention as claimed. Scott et al., however, teaches the invention substantially as claimed, wherein the web server (**Scott et al. -- Figure 1 item 22 and Column 4 line 13**) routes the request to the first application server and the first application server establishes a session with the client computer and generates

a session identification (**Scott et al. -- Column 4 lines 26-38 – When a request is received without a session identifier, the HTTP server routes the request to a given server, i.e. first server, which processes the request and generates a session ID**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the session identification generation capabilities of Scott et al. into the invention of Chung et al. in order to provide a mechanism for generating session ID's to first-time clients which in turn establishes a session relationship with a server for future access and stores the information in the database for other servers to access.

24. Regarding claim 23, Chung et al. does not explicitly teach the invention as claimed. Serbinis et al., however teaches the invention substantially as claimed, wherein the first application server stores the session data in the database (**Serbinis et al. -- Figure 1B and Col. 6 lines 19-33 – As shown in Figure 1B, the servers, i.e. application servers store session data in the database (25)**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Chung et al. to have the application server store the session data in the database as taught by Serbinis et al. in order to produce a more efficient system by eliminating the need for another intermediary server to store the information.

25. Regarding claim 24, Chung et al. teaches the inventions substantially as claimed, wherein the web server receives a second request including the session identification (**Chung et al. -- Col. 7 lines 64-66 – The request packet contains the client IP address (session**

**identification), performs a calculation on the session identification to form a value (Chung et al.**

**-- Col. 4 lines 37-39 – The client IP address which acts as the session identifier has a first value calculated from it by performing a hash function on the session identifier) and routes the request to the second application server based on the value (Chung et al. -- Col. 4 lines 59-63 – The computed hash value from the session identifier is compared to a list of servers to determine which server should handle the request).**

26. Regarding claim 25 and 26, these are program claims corresponding to the methods claimed in claims 1 and 8. Chung et al. teaches a dispatcher which includes an operating system (Col. 7 lines 45-47), i.e. server, which performs the calculations on the session identifier (Chung et al. -- Col. 4 lines 37-39 – The client IP address which acts as the session identifier has a first value calculated from it by performing a hash function on the session identifier) and routes the request to the proper server based on a table (Chung et al. -- Col. 4 lines 59-63 – The computed hash value from the session identifier is compared to a list of servers to determine which server should handle the request). It is obvious that in order for the dispatching system to operate, calculate values, and route requests based on information from a table, instructions must be stored on some type of computer readable medium in order for the dispatching server to carry out its duty. Therefore, claims 25 and 26 are rejected under the same rationale as applied to claims 1 and 8 above.

***Conclusion***

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,587,866 to Modi et al. teaches a method for distributing loads to server nodes using hashed values from a table. U.S. Patent No. 6,345,291 to Murphy, Jr. et al. teaches a method for multiplexing a group of clients among a group of servers configured in a master/slave configuration. U.S. Patent No. 6,389,419 to Wong et al. teaches a method for storing and retrieving session information based upon a hashed index value.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas J. Mauro Jr. whose telephone number is 703-605-1234. The examiner can normally be reached on M-F 8:00a.m. - 4:30p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A. Wiley can be reached on 703-308-5221. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

  
Thomas J. Mauro Jr.  
Examiner  
Art Unit 2143

  
TJM  
September 2, 2003

  
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